

## **REMARKS**

The present application is directed to modified viral particles. Claims 1-2, 28-31, 33-47, 49-51, 53 and 54 are pending upon entry of the current amendments. In this Response, Applicants cancel Claims 48 and 52 and amend Claim 54 based on the previously presented Claim 1. The amendments do not introduce any new matter.

### *Interview*

Applicants thank the Examiner for the courtesy of an interview on December 14, 2007. During the interview, Applicants' representative and the Examiner reviewed the rejections of record and agreed that, in order to overcome the rejection over U.S. Patent No. 6,136,321 ("Barrett"), Applicants will submit the remarks, supported by a Declaration, that are similar to those filed in the related U.S. Patent Application Serial No. 10/873,015, and that Applicants will amend the claims to overcome the rejections under 35 U.S.C. §112, first paragraph. Applicants agree with the Interview Summary provided by the Examiner. In this Response, Applicants submit the remarks and the claim amendments, as discussed above, and request allowance of the claims, as pending upon entry of the amendments.

### *Claim Rejection under 35 U.S.C. §112, First Paragraph*

The Examiner rejects Claims 48 and 52 under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement. The Examiner asserts that the claims contain new matter, a concentration range "0.5% to 2.5%," which is not supported by the application, as filed. In this Response, Applicants cancel Claims 48 and 52, thereby rendering their rejection moot. Applicants request withdrawal of the rejection.

### *Claim Rejections under 35 U.S.C. §102(b)/103(a)*

The Examiner maintains the rejection of Claims 1, 2, 28-31 and 33-54 under 35 U.S.C. §102(b) as anticipated by Barrett. In this Office Action, the Examiner also alternatively rejects the claims as obvious in view of Barrett under 35 U.S.C. §103(a).

Applicants cancel Claims 48 and 52, thereby rendering their rejection moot, and traverse the rejection of the claims, as pending upon entry of the current amendments.

The claims are directed to modified viral particles comprising partially delipidated viral particles obtained by a delipidation process comprising treatment of viral particles with an organic solvent that is not a detergent or a surfactant. In contrast, Barrett uses non-ionic surfactants, particularly polysorbate, for inactivating lipid enveloped viruses. The Examiner asserts, for example, on page 7 of the Office Action that the structure of the inactivated viruses in Barrett is expected to be the same as that of Applicants' claimed particles, because Applicants disclose in the specification that detergents/surfactant may be used to delipidate viruses. The Examiner also asserts on page 7 of the Office Action that the effects of a detergent or a surfactant on a virus are expected to be the same as of the other solvents encompassed by the claims.

Applicants wish to rebut the Examiner's position. Applicants provide evidence with this Response, in the form of a Declaration by Dr. Moiz Kitabwalla ("Declaration"), a person of ordinary skill in the art in the field of the present application, that the effects of detergents or surfactants on HIV virus are different from those of an organic solvent that is not a detergent or a surfactant. Applicants previously submitted the Declaration in the related co-pending U.S. Patent Application Serial No. 10/873,015. A copy of the Declaration is enclosed as Exhibit A. As evidenced by the Declaration, the experimental results demonstrate that partially delipidated human immunodeficiency viral particles obtained by delipidation with an organic solvent that is not a detergent or a surfactant, for example, diisopropyl ether (DIPE) ("partially delipidated HIV particles"), are structurally different from the delipidated human immunodeficiency virus (HIV) obtained by a detergent treatment method disclosed in Barrett ("detergent-treated HIV") (item 3 of the Declaration). The experimental results demonstrate that partially delipidated HIV particles possess unexpected advantages as compared to detergent-treated HIV (item 4 of the Declaration).

In particular, the experimental results show that detergent-treated HIV contains substantially less HIV p24 Capsid Protein ("p24") as compared to partially delipidated HIV particles, and that, with respect to preservation of p24 content, partial delipidation of HIV by an organic solvent is unexpectedly advantageous as compared to detergent treatment (item 6 of the Declaration). The experimental results also show that total protein content is significantly lower in detergent-treated HIV as compared to partially-delipidated HIV particles (item 7 of the Declaration). A cholesterol to total protein ratio in partially delipidated HIV particles is decreased as compared to control. In contrast, a cholesterol to total protein ratio in detergent-treated HIV is increased, as compared to control (item 7 of the Declaration). The experimental results also show that partial delipidation of HIV by an organic solvent is unexpectedly advantageous, as compared to HIV detergent treatment, with regard to preservation of total HIV protein content, which indicates better preservation of structural integrity of partially delipidated HIV particles as compared to detergent-treated HIV (item 7 of the Declaration).

Additionally, the experimental results show that detergent treatment of HIV, as compared to partial delipidation of HIV with an organic solvent, such as DIPE, results in a substantially lower number of virion particles observed by electron microscopy (EM) (item 8 of the Declaration), and that detergent treatment of HIV deleteriously affects structural integrity of the resulting detergent-treated HIV. In comparison, partial delipidation by an organic solvent is unexpectedly advantageous, as compared to detergent treatment, because it preserves structural integrity of partially delipidated HIV particles (item 8 of the Declaration). Furthermore, the experimental results show that detergent treatment results in substantial loss of virion structural integrity, as observed by EM, including damage to viral envelope, core/capsid and membrane (item 9 of the Declaration). The experimental results also indicate that detergent treatment substantially alters the morphology of HIV virion particles, resulting in stripping of viral envelopes and substantial loss of the viral capsid core. In comparison to detergent treatment, as disclosed in Barrett, partial delipidation by an

organic solvent, as recited in the claims, as currently amended, is unexpectedly advantageous for preservation of structural integrity of partially delipidated HIV particles.

Applicants therefore assert that the particles disclosed in Barrett are structurally different from the particles recited in the claims, as pending upon entry of the current amendments. Barrett fails to disclose, explicitly or inherently, partially delipidated viral particles recited in the claims, the particles being obtained by treating a viral particle with an organic solvent that is not a detergent or a surfactant. Barrett also fails to teach, suggest or provide motivation to derive the process recited in the claims or the partially delipidated viral particles recited in the claims. Furthermore, the claimed particles possess unexpected advantages as compared to the detergent-treated HIV disclosed in Barrett. In view at least of the foregoing, Applicants assert that Barrett fails to anticipate currently pending claims and fails to render them obvious.

The Examiner asserts that detergents or surfactants and solvents that are not detergents or surfactants “are functional equivalents” because they were all included in a Markush group in previously pending claims (Office Action, page 7). Applicants assert that the evidence provided herein rebuts the Examiner’s assertion. Detergent treatment results in detergent-treated HIV that is structurally different from partially delipidated HIV particles obtained by delipidation with a non-detergent, such as diisopropyl ether (Declaration). The claims presented in this Response are directed to an embodiment of Applicants’ particles that are partially delipidated by an organic solvent that is not a detergent or a surfactant. An embodiment of a delipidation process that uses detergent/surfactant to reduce lipid content in a viral envelope, even if it is discussed in the specification or was recited in the previously pending claims, is not the subject matter of the pending claims.

Applicants have not identified any rules in the MPEP that would preclude patentability of claims reciting a patentable embodiment, even if an embodiment asserted by the Examiner to be unpatentable was disclosed or previously claimed in an application. To the contrary, the MPEP encourages claim amendments to exclude an embodiment that an

Examiner considers unpatentable. *See*, for example, MPEP 2107.02(I), which states: “[W]here it can be established that ... species clearly encompassed by the claim do not have utility ..., the applicant should be encouraged to amend the generic claim so as to exclude the species that lack utility.” Accordingly, Applicants assert that patentability of the claims reciting an embodiment of partially delipidated particles obtained by treatment with a solvent that is not a detergent or a surfactant is not precluded by the disclosure in the present application or previously pending claims of an embodiment obtained by treatment with a detergent or a surfactant.

Thus, Barrett fails to anticipate pending claims at least because, first, the currently pending product-by-process claims do not recite the process disclosed in Barrett for obtaining detergent-treated HIV, and, second, partially delipidated viral particles recited in the claims are structurally different from the detergent-treated HIV disclosed in Barrett. Furthermore, Barrett fails to render the pending claims obvious at least because Barrett discloses that a specific approach to inactivation, namely, detergent inactivation, creates inactivated virus allegedly possessing superior properties, such as structural integrity. *See*, for example, Barrett, column 3, lines 9-15. Accordingly, Barrett teaches away from using other processes, such as the claimed process, for obtaining the viral particles possessing the structural integrity. Barrett also fails to suggest or provide motivation to those of ordinary skill in the art in the field of the present application to use the claimed process to obtain partially delipidated viral particles.

Based on the disclosure in Barrett, one of ordinary skill in the art in the field of the present application would expect from the detergent-treated virus in Barrett to maintain superior structural integrity as compared to the partially delipidated particles recited in the pending claims. However, opposite to what Barrett suggests to one of ordinary skill in the art in the field of the present application, evidence provided with this Response shows that the partially delipidated particles recited in the claims maintain superior structural integrity, as compared to the detergent-treated HIV disclosed in Barrett. Barrett fails to render the pending claims reciting the partially delipidated viral particles obvious at least due to the

unexpected advantage of the process recited in the claims and the resulting particles, as compared to the processes and the resulting detergent treated viruses disclosed in Barrett.

For at least the foregoing reasons, Applicants assert that Barrett fails to anticipate or render obvious the currently pending claims and request that claim rejections under 35 U.S.C. 102(b) and/or 103(a) be withdrawn.

## **CONCLUSION**

The foregoing is submitted as a full and complete response to the Non-Final Office Action mailed August 17, 2007. No additional fees are believed due, however, the Commissioner is hereby authorized to charge any deficiencies that may be required or credit any overpayment to Deposit Account Number 11-0855.

Applicants assert that the claims are in condition for allowance and respectfully request that the application be passed to issuance. If the Examiner believes that any informalities remain in the case that may be corrected by Examiner's amendment, or that there are any other issues which can be resolved by a telephone interview, a telephone call to undersigned agent at (404) 815-3102 or to Dr. John K. McDonald at (404) 745-2470 is respectfully solicited.

Respectfully submitted,

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